

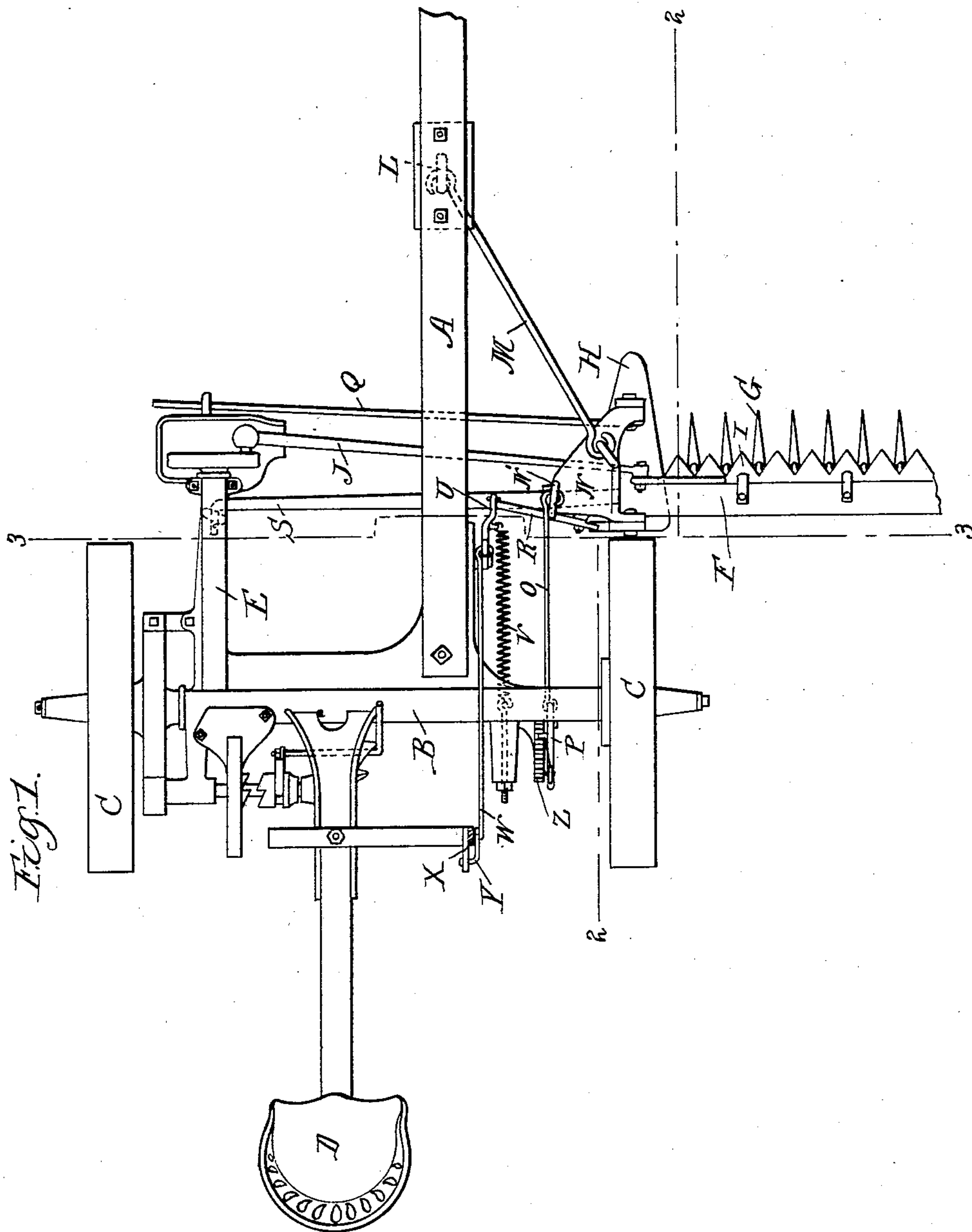
(No Model.)

2 Sheets—Sheet 1.

M. KANE.  
MOWING MACHINE.

No. 591,923.

Patented Oct. 19, 1897.



Witnesses.

Wm. M. Rheem.  
Wm. F. Huming

Inventor.  
Maurice Kane  
by Brown & Darby attys

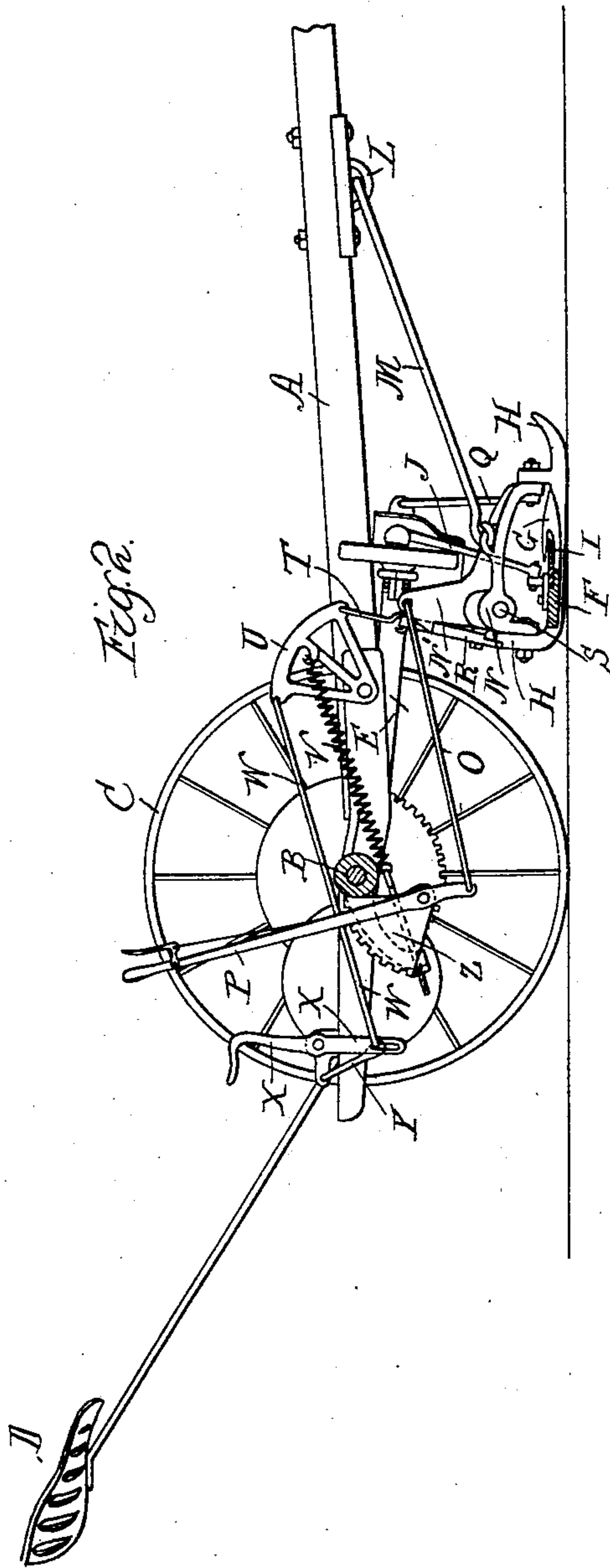
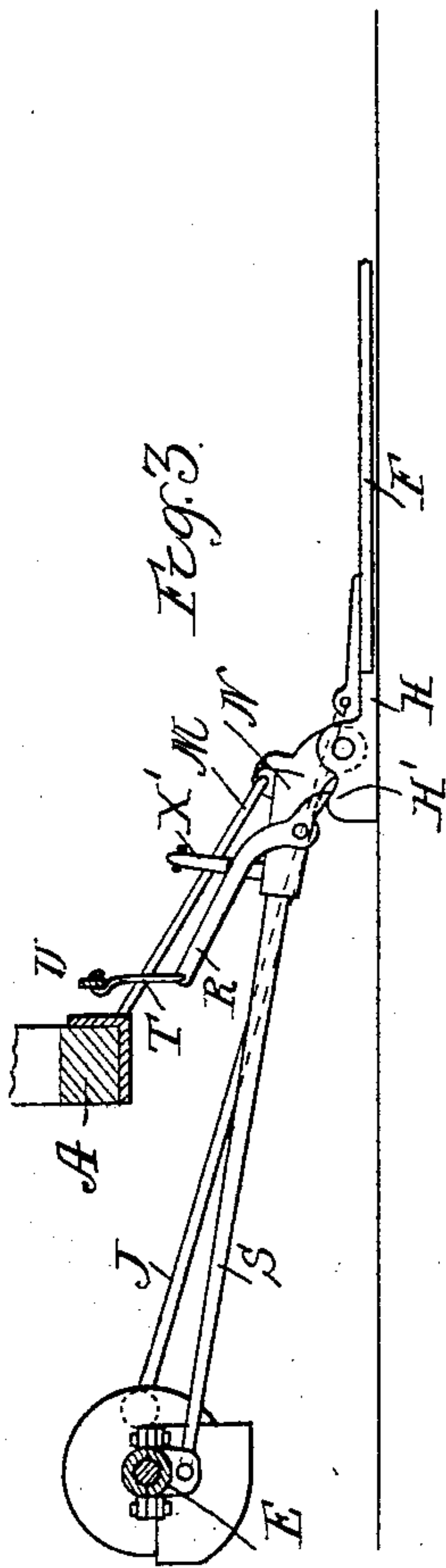
(No Model.)

2 Sheets—Sheet 2.

M. KANE.  
MOWING MACHINE.

No. 591,923.

Patented Oct. 19, 1897.



Witnesses.  
S<sup>rs</sup> M. Rhein  
Wm L. Hamung

Inventor.  
Maurice Kane  
by Brown & Darby Attys.



# UNITED STATES PATENT OFFICE.

MAURICE KANE, OF AUSTIN, ILLINOIS.

## MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 591,923, dated October 19, 1897.

Application filed July 13, 1896. Serial No. 598,961. (No model.)

*To all whom it may concern:*

Be it known that I, MAURICE KANE, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented new and useful Improvements in Mowing-Machines, of which the following is a specification.

This invention relates to improvements in mowing-machines.

10 The invention consists substantially in the construction set forth in the subjoined specification and more particularly pointed out in the claims.

15 Like letters refer to the same parts in the several figures of the drawings, in which—

Figure 1 illustrates a plan view of the machine. Fig. 2 illustrates a vertical longitudinal section of the machine through the line 2 2, Fig. 1; and Fig. 3 illustrates a cross-section of the machine through the line 3 3, Fig. 1.

20 In the drawings, A designates the tongue of the machine, which is of the usual construction, B the main axle, C C the wheels, E the frame, D the seat, F the finger-bar, 25 G the guards, H the shoe, I the knife, and J the pitman, all of which parts are of the usual construction and need not be specially described. Many other parts of the usual form of mowing-machine are shown in the 30 drawings, which need not be particularly described, inasmuch as they involve no novelty.

The tongue has secured to it a plate containing a staple or eye L, in which hooks the bent end of the drag-bar M, the other end of 35 which hooks in an eye formed on the top of a metal piece N, which, because it is fastened to opposite sides of the shoe and passes above and over the finger-bar, may be appropriately termed a "bridge." It will be observed that 40 this drag-bar is thus secured in front of the machine. Any strain caused by the finger-bar meeting an obstruction or otherwise will be resisted by the drag-bar and will tend to pull the tongue down and through the tongue 45 hold the main frame and traction-wheels in their proper position with the wheels bearing firmly against the ground. This effect is advantageous, for it is the traction of the wheels upon the ground which gives motion to the 50 working parts of the machine. In constructions in which the finger-bar has been braced

by a bar joined to it at the rear and extending upward to the main frame, the effect has been that when a strain was put upon the finger-bar and through it upon the push-bar 55 just mentioned, which braced it, the upward pressure of such push-bar would tend to lift the main frame and the wheels, and thus reduce the traction and interfere with the consequent driving of the operative parts of the 60 machine. These defects are remedied by employing a drag-bar connected to the finger-bar and to the tongue in the manner described, and, at the same time, a direct and simple construction is produced. This shoe-bridge 65 N is pivoted to flanges projecting from the shoe on opposite sides of the cutter-bar, as best shown in Fig. 2, and it is provided with a vertical standard N', which at its upper end has a hole or perforation for the engagement of the hooked end of a connecting-link 70 O, for a purpose to be hereinafter specified.

The connecting-link O is at its outer end pivoted to the lower end of a hand-lever P, which latter is, as shown in Figs. 1 and 2 of 75 the drawings, provided with a hand-operated pawl, engaging with a ratchet Z, so that said lever may be held in any desired position. This bridge over the cutter has extending through it in the same direction as the finger-bar—that is, transversely of the machine—a 80 socket in which pivots a bar S, the other end of which latter is hooked in an eye formed in a small bracket depending from the opposite side of the frame from the shoe, and a rod Q 85 is pivoted to the forward inside portion of the bridge over the cutter and extends outwardly to and slides in an eye in the frame. These two rods S and Q thus serve to hold the shoe and bridge in proper position and 90 yet allow pivotal movements, and the rod S also by pivoting in the socket in such bridge acts as a journal upon which the bridge-shoe, finger-bar, and rods may be tilted, so as to change the inclination of the knife-guards. 95 This tilting movement is given by the lever P and connecting parts before described, which, as stated, join such lever to the upwardly-projecting standard N' of the bridge.

It is to be noticed that the connection between the frame and the shoe is direct, because the drag-bar, as before described, is 100



connected to the tongue and to the bridge, which forms the pivoted connection to the shoe.

Another mechanism is employed to lift the 5 finger-bar and this will now be described. The shoe has formed upon its inner side a toe H', and bearing upon this toe, as shown in Fig. 3, is another toe formed upon a gag-lever R, which latter is pivoted to the bridge 10 and at its upper end is connected by a link T to a triangular lever U, which latter is connected by a rod W with a foot-lever X. The usual coiled spring V is adjustably secured at one end to the frame and at the other end 15 to a hook upon the triangular lever U, and the tension of such spring is adjusted so that it will practically take the weight of the shoe, finger-bar, bridge, and adjacent parts from the ground.

20 In the operation of mowers, the cutting and adjacent mechanism is at a lower level than the operator, and sometimes it is advisable and, in fact, necessary for the operator to lift such mechanism, and in so doing the lines 25 of force exerted for the purpose act in two directions—namely, first, in a vertical direction, and, secondly, in a backward horizontal direction. To make a proper connection between the driver and the cutting mechanism 30 for the lifting purpose just mentioned, there should be interposed some device for changing the vertical direction of movement to the rearward or approximately horizontal direction, and this device, of course, may be varied, 35 but whatever it is, whether in the shape of a bell-crank lever, such as a triangular arm or some other device for the purpose, it is evident that the greatest leverage in the device is against the driver at the time when he first 40 begins to attempt to lift, for the reason that he is then pulling at a more or less acute angle, or, in other words, more nearly in line with the center of the device which changes the direction of force than he is later in the 45 movement of such device when the point of attachment of the connections between the driver and such device has reached a position more nearly at a right angle to the line of force exerted by such driver. It is there- 50 fore obvious that as the driver must exert more force at the beginning of his lifting movement than at the end of such movement the mechanism should be so adjusted as to compensate for this, and thus relieve the 55 driver of the extra strain. This is provided in the present mechanism by arranging the manually-operated lever in such a manner that it gives greater leverage at the beginning of its stroke and more ample movement 60 and less leverage toward the end of its stroke. The spring or other device which is ordinarily used to assist the driver in its operation must be attached to the device by changing the direction of movement so as to normally exert 65 its line of force at an acute angle, because otherwise it would have too much power on the cutting mechanism in the usual operation

of the machine when it was desired to lift such mechanism, and this makes it necessary to connect the driver's operating mechanism 70 at a similar angle. In the form illustrated, which is that preferred, these effects are accomplished. The lever X has its lower end vertically slotted and the bent end of the link T passes into such slot and is secured to the 75 lower end of a push-bar Y, the upper end of which is pivoted to a stationary bracket upon the frame, so that as the foot-lever is pressed downward, the leverage of the weight end thereof is gradually changed, because the 80 push-bar Y forces down in the slot the end of link W, and thereby increases the distance from the pivot of the foot-lever to the point of connection of the link W with such lever. As before indicated, when the foot-lever is 85 first pressed upon with the purpose of lifting the finger-bar over an obstruction or partially folding said finger-bar, the leverage exerted by such lever is greatest, because its weight end is at its shortest effective length, but as 90 such lever continues to move the triangular or bell lever turns to the left nearer to a vertical position and its leverage is changed, or rather the driver is then exerting the force at a better angle and does not have to apply so 95 much power, and the spring is exerting its force at a better angle and is assisting the driver to a greater degree than at first; and it consequently becomes desirable to shorten the distance the bell-crank lever is to move, 100 which latter purpose is effected simultaneously, because as the link W moves downward in the slot it lengthens the weight end of the foot-lever, and thereby gives the latter more ample movement than before for a cer- 105 tain distance of movement of the upper end of such lever.

The foot-lever when depressed causes two operations. It causes the outer end of the finger-bar to lift and turn on the pivots by 110 which the shoe at the inner end of the cutter-bar is pivoted to the bridge, and this is because the toe of the gag-lever R bears upon a toe H' at the rear of the shoe. The additional movement is the lifting of the shoe it- 115 self, which is simultaneously effected, because the gag-lever is pivoted to the bridge, and as its upper end is lifted by the connections to the foot-lever its lower end or toe bears upon the toe of the shoe as a fulcrum and lifts the 120 bridge which, in turn, being joined to the shoe forward of this point, lifts the shoe from the ground.

By the construction and arrangement of parts above described the finger-bar and shoe 125 are given the usual two necessary movements by the operator—to wit, a tilting movement to change the relative position of the knife-guards to the ground and a lifting movement to clear obstructions, and these movements 130 are effected while maintaining an otherwise fixed relation of the parts, because of the direct connection of the bridge with the manipulating parts which give the movements.



In other words, the bridge is connected directly to the tongue by the drag-bar, and directly to the hand-lever for tilting by means of its upward standard and links, and directly to the lever and links which join it to the foot-lever. This simplifies and renders more efficient the construction for the purposes intended.

It is obvious that many modifications may be made in the exact construction and arrangement without departing from the principle of the invention, and I therefore do not desire to be understood as limiting myself to the precise construction shown and described.

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

1. In a mowing-machine, the combination with a hinged finger-bar, a manually-operated lever, connections between such bar and lever including a device for changing the direction of pull, and mechanism for decreasing the effective length of the lever and increasing the effective throw or travel of the weight-arm of the manually-operated lever when it is actuated; substantially as and for the purpose set forth.

2. In a mowing-machine, the combination with a hinged finger-bar and a manually-operated lever, of connections between such bar and lever including an automatic lifting device such as a spring and a device to change the direction of pull and mechanism for decreasing the effective length of the lever and increasing the effective throw or travel of the weight-arm of the manually-operated lever while it is being actuated; substantially as and for the purpose set forth.

3. In a mowing-machine, the combination with a pivoted finger-bar, of a triangular lever connected to the same and pivoted on the frame, a spring connected at one end to the frame and at the other end to the triangular lever, a link connecting the upper side of the triangular lever with another lever within reach of the operator, the lever within reach of the operator having an elongated slot for the end of the link to enter, and a

push-bar jointed to the frame and bearing upon the ends of the link, whereby its position in the slot is varied as the lever is turned; substantially as and for the purpose set forth.

4. In a mowing-machine, the combination with a finger-bar pivoted on a transverse pivot, the operating-lever extending within reach of the driver, a link connecting the lower end of such lever with mechanism upon the finger-bar and jointed to such mechanism at a point above the level of its joint with the operating-lever, and a drag-bar pivoted to the tongue or frame and also pivoted to the mechanism upon the finger-bar at a point lower than the joint of the link before mentioned to such mechanism and lower than the joint of the drag-bar to tongue or frame; substantially as and for the purpose set forth.

5. In a mowing-machine the combination with a finger-bar and its shoe, the latter provided with an inwardly-projecting toe, a bridge extending over the finger-bar and pivoted by longitudinal pivots to the shoe, a gag-lever provided at its lower end with a toe bearing on the toe of the shoe, a triangular lever pivoted to the frame and connected to the upper end of the gag-lever, an adjustable spring connected to the frame and bearing on the triangular lever, a link pivoted at one end to the upper end of the triangular lever and at the other end to the operating-lever in an elongated slot thereof, an operating-lever pivoted to the frame and provided with an elongated slot for connection with the link and a push rod or bar pivoted to the frame and bearing upon the end of the link which plays in the elongated slot of the operating-lever; substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand, this 10th day of July, 1896, in the presence of the subscribing witnesses.

MAURICE KANE.

Witnesses:

FRANK T. BROWN,  
M. I. CAVANAGH.