

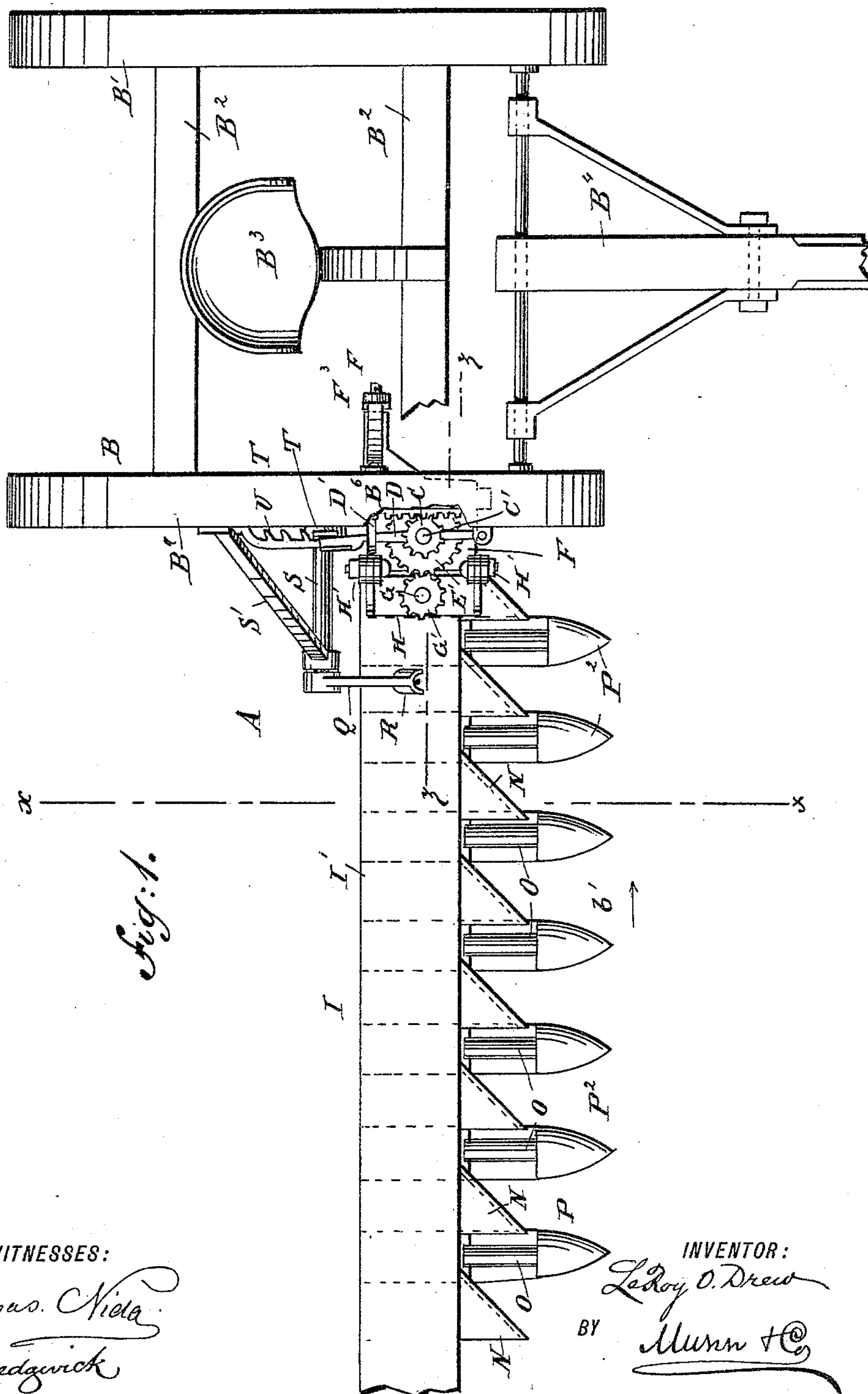
(No Model.)

4 Sheets—Sheet 1.

LE ROY O. DREW  
MOWING MACHINE.

No. 411,591.

Patented Sept. 24, 1889.



WITNESSES:  
*Chas. Viola*  
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INVENTOR:  
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ATTORNEYS.

4 Sheets—Sheet 2.

Patented Sept. 24, 1889.



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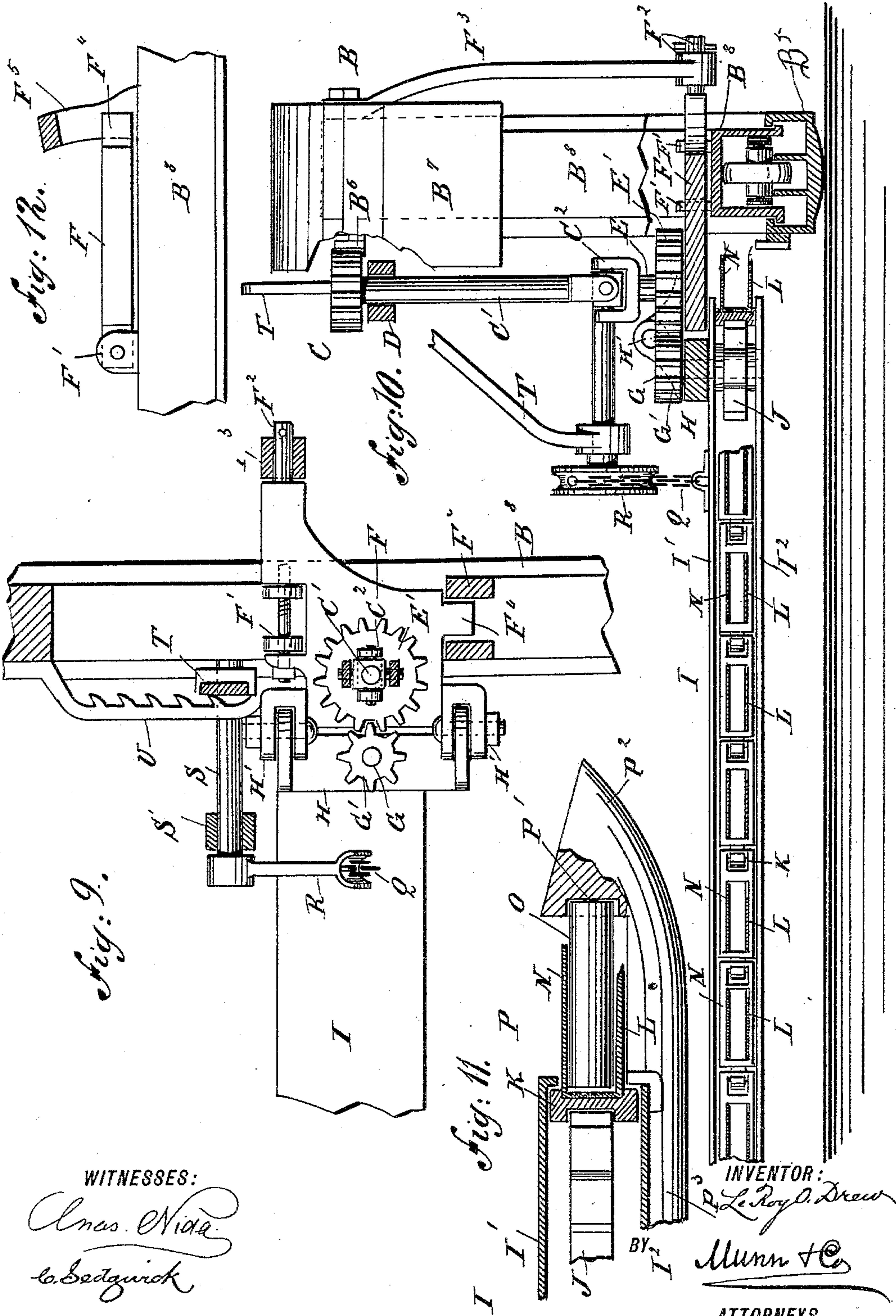
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# UNITED STATES PATENT OFFICE.

LE ROY O. DREW, OF CARTHAGE, DAKOTA TERRITORY.

## MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,591, dated September 24, 1889.

Application filed September 6, 1888. Serial No. 284,710. (No model.)

### *To all whom it may concern:*

Be it known that I, LE ROY O. DREW, of Carthage, in the county of Miner and Territory of Dakota, have invented a new and Improved Mowing-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved mowing-machine which is simple and durable in construction and very effective in operation, clamping the grass in place for the knives to cut.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter more fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement. Fig. 2 is a sectional side elevation of the same on the line  $x x$  of Fig. 1. Fig. 3 is an enlarged plan view, partly in section, of the cutter-bar. Fig. 4 is a front view of the same with parts in section. Fig. 5 is an enlarged side elevation, partly in section, of the guard. Fig. 6 is a perspective view of the guard-roller. Fig. 7 is a perspective view of one of the knives. Fig. 8 is a like view of the clamping-plate for the guard-roller. Fig. 9 is an enlarged sectional plan view of part of the improvement on the line  $y y$  of Fig. 2. Fig. 10 is an enlarged sectional end elevation of the improvement on the line  $z z$  of Fig. 1. Fig. 11 is an enlarged sectional end elevation of the cutter-bar, and Fig. 12 is an enlarged side elevation of a stop for the cutter-bar.

The improved mowing-machine A is provided with an inside and outside traction-wheel B and B', respectively, similar in construction and operation to the traction-wheel shown and described in an application for Letters Patent filed by me of even date herewith and having the Serial No. 284,709. The said wheels B B' are rigidly connected by a frame B<sup>2</sup>, to which the driver's seat B<sup>3</sup> and the guiding-tongue B<sup>4</sup> are suitably attached. Said frame B<sup>2</sup> consists, mainly, of pairs of parallel vertical bars and pairs of horizontal bars suitably attached at their ends to the frames of the wheels. The latter are essentially

oval-shaped, as shown in Fig. 2. Each wheel has an elongated or oval track B<sup>8</sup>, the top and bottom portions being nearly straight and the ends essentially semicircular. The track B<sup>8</sup> is U-shaped in cross-section and provided with lateral flanges, which engage (see Fig. 10) with inwardly-projecting annular flanges of the links constituting the endless chain B<sup>5</sup>, that runs on and around said track. On one side of the chain-links are formed teeth B<sup>6</sup>, which, as the chain travels, successively mesh with the pinion C, fixed on the upper end of the vertical shaft C', having its upper bearing in the lever D, fulcrumed at one end to the cover B<sup>7</sup> of the traction-wheel B and held on its other end in a keeper D', having an inner and outer notch and secured to the cover of the wheel B. When the lever D is moved into the outer notch of the said keeper D', the pinion C is out of mesh with the said gear-wheel and the cutting mechanism is at a standstill. The lower end of the shaft C' is connected by a universal joint C<sup>2</sup> with the shaft E, which is stepped at its lower end in a plate F, pivoted at F' to the lower part of the stationary track B<sup>8</sup> of the traction-wheel B. On the inner end of the plate F and in line with the pivot F' is secured a trunnion F<sup>2</sup>, held to turn in a brace F<sup>3</sup>, extending upward and secured to the cover B<sup>7</sup> of the traction-wheel B. On the plate F, opposite the pivot F', is formed a lug F<sup>4</sup>, held in a U-shaped guideway F<sup>5</sup>, the top of which limits the upward swinging motion of the plate F, as plainly shown in Fig. 12. The shaft E carries a gear-wheel E', meshing into a pinion G', secured on the upper end of a shaft G, mounted to rotate in the plate H, fastened to the finger-bar I and pivotally connected at H' to the plate F. The pivots H' are in line with the points of contact of the pitch-lines of the gear-wheel E' and the pinion G', (see Fig. 9,) so that the plate H can freely swing upward on the plate F, and the gear-wheel E' and pinion G' remain in mesh.

The finger-bar I is provided with a top and bottom plate I' and I<sup>2</sup>, respectively, between which are held at their ends the sprocket-chain pulleys J and J', of which the former is secured on the shaft G and the latter turns on the stud J<sup>2</sup>, secured to the plates I' and I<sup>2</sup>.



Around the sprocket-chain pulleys J and J' travels an endless sprocket-chain K, on each link of which is secured a knife-blade L and a clamping-blade N, both extending horizontally and outwardly from the respective link of the chain K. Both blades L and N are triangular in shape, and the knife-blade L is located below the clamping-blade N, and with its cutting-edge L' slightly in the rear of the edge N' of the clamping-blade N as the chain moves around the finger-bar. The knife-blades L are adapted to pass freely under the rollers O, each mounted to turn on a spindle P', projecting rearwardly from the pointed front end P<sup>2</sup> of the guard P, secured by its shank P<sup>3</sup> to the under side of the plate I<sup>2</sup> of the finger-bar I. The knife-blade L is adapted to pass snugly over the top surface of the said shank P<sup>3</sup> and under the roller O, so that the edge of the shank P<sup>3</sup> forms a cutting-edge with the diagonal edge L' of the blade L when the latter passes over the guard. The blade N is adapted to pass snugly over the top of each roller O, so that the latter is turned on its spindle P' of the respective guard P, and grass entering between the inner end of the diagonal edge N' and the roller O is clamped between the blade N and the top of the roller O and cut by the following diagonal cutting-edge L' of the knife-blade L. The roller O fits with one end into an annular recess formed in the pointed end P<sup>2</sup> of the guard P, as shown in Fig. 11, to prevent the grass from clogging. On the bottom of the shank P<sup>3</sup> of each guard P are formed the V-shaped ridges P<sup>4</sup>, adapted to travel on the ground.

On the top plate I' of the finger-bar I is secured one end of a chain Q, extending upwardly and passing over the rim of the segmental pulley R, mounted to swing on a shaft S, held to rotate in suitable bearings on the traction-wheel frame and in a brace S', extending from the said traction-wheel frame, as plainly shown in Fig. 1. On the shaft S is secured a hand-lever T, extending upwardly and adapted to be locked in position on the toothed bar U, fastened on the traction-wheel B. The upper end of the lever T is within convenient reach of the operator seated on the seat B<sup>3</sup> of the frame B<sup>2</sup>.

The operation is as follows: When the mowing-machine A is drawn forward in the direction of the arrow a', a traveling motion is imparted to the endless chain B<sup>5</sup>, which imparts a rotary motion to the gear-wheel C, secured to the shaft C', and the latter by means of the gear-wheel E' imparts a similar motion to the pinion G' on the shaft G. The rotary motion of the shaft G rotates the sprocket-pulley J, thereby imparting a traveling motion to the endless chain K in the direction of the arrow b', so that the several clamping-blades N and knife-blades L pass, respectively, over and under the rollers O, mounted in the guards P. The latter travel forward with the machine in the direction of the arrow a', so that the

grass to be cut passes between the several guards P and the clamping-blades N, which latter clamp the grass onto the top of the rollers O and hold the same in place until the following knife-blade L cuts the grass between its roots and the part clamped between the blade N and the top of the roller O. The grass is held by the clamping-blade N and the roller O of each guard P until it is cut by the knife-blade L, after which the movement of the endless chain K in the direction of the arrow b' causes the clamped grass to pass out of the roller O and the said clamping-blade when the latter has completely passed over the respective roller O. This movement of the grass is only to the extent of about one inch, and in consequence of the forward motion of the machine the grass tends to fall back of the finger-bar as soon as thus liberated, so that serious clogging is not likely to occur in ordinary work.

It is understood that this motion of the clamping-blade N over the roller O causes the latter to revolve, thus rolling the lower end of the same and the cut grass from between the said roller O and the clamping-blade N. When the operator desires to stop the motion of the endless chain K, he moves the lever T outwardly, so that the pinion C is disengaged from the elongated gear-wheel B<sup>6</sup>, whereby the rotary motion of the said pinion C ceases. When the operator desires to throw the finger-bar I out of contact with the grass, he moves the lever T rearwardly and locks it in a rearward position in the toothed bar U. This rearward motion of the lever T causes an upward motion of the segmental pulley R, whereby the chain Q is raised and the latter (with the plate H and the plate F) is tilted, all swinging on the pivot F' of the said plate F. As soon as the lug F<sup>4</sup> on the plate F strikes against the top of the U-shaped stop F<sup>5</sup> the tilting motion of the several parts ceases, and an upward swinging motion of the finger-bar I and its plate H takes place, as the latter is pivoted at H' to the plate F. Thus the finger-bar I is first tilted into an inclined position and then swung upward by a single movement of the said lever T.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a mowing-machine, the combination, with a traction-wheel, as described, of an endless chain receiving a traveling motion from the forward motion of the said traction-wheel, a finger-bar carrying the said traveling chain, knife-blades held on the said endless chain, clamping-blades held parallel with the said knife-blades and slightly in front of the same, and guards secured on the said cutter-bar and each carrying a roller, above and below which travel the said clamping-blades and the said knife-blades, respectively, substantially as shown and described.

2. In a mowing-machine, the combination, with a traction-wheel provided with an end-



less traveling chain, of a finger-bar held to tilt and to swing on the said traction-wheel, an endless sprocket-chain held on the said finger-bar and deriving its motion from the  
5 endless chain of the said traction-wheel, guards held on the said cutter-bar and each provided with a roller, and clamping and knife blades held on the said endless sprocket-chain and passing over and under the said  
10 rollers, respectively, substantially as shown and described.

3. In a mowing-machine, the combination, with a finger-bar, of an endless sprocket-chain mounted to travel on the said finger-bar, guards projecting from the said finger-bar and each provided with a roller, and clamping and knife blades held on the said sprocket-chain and passing, respectively, over and under the said rollers, substantially  
20 as shown and described.

4. In a mowing-machine, the combination, with guards held on the finger-bar and each provided with a roller, of a clamping-blade adapted to pass over the top of the said roller  
25 to clamp the grass in position for cutting, substantially as shown and described.

5. In a mowing-machine, the combination, with guards held on the finger-bar and each provided with a roller, of a clamping-blade adapted to pass over the top of each roller to clamp the grass, and a knife-blade adapted to pass over the said guard and under the said roller to cut the grass clamped between the said roller and clamping-blade, substan-  
35 tially as shown and described.

6. In a mowing-machine, the combination, with the track B<sup>8</sup>, a plate F, pivoted to the latter, the pivots being arranged transversely of the said track, and thereby adapting the  
40 plate to swing vertically in line with it, and a shaft mounted to turn in the said plate and carrying a gear-wheel, of a finger-bar pivotally connected with the said plate, a shaft mounted to turn in the said finger-bar and carrying a pinion meshing into the said gear-wheel, the said shaft imparting motion to an endless chain carrying the knife-blades, and a lever mounted on the track and connected with the said finger-bar for successively tilting  
45 and raising the said finger-bar, substantially as shown and described.

7. In a mowing-machine, the combination, with the track B<sup>8</sup>, and a plate F, pivoted to the latter, the pivots being arranged transversely of the said track, and thereby adapting the  
55 plate to swing vertically in line with it, provided with a stop-lug, of a cutter-bar pivotally connected with the said pivoted plate, a fixed bracket to limit the swinging movement of the said pivoted plate, and a lever mounted  
60 on the track and connected with the said finger-bar to tilt and raise the latter successively, substantially as shown and described.

8. In a mowing-machine, the combination, with the track B<sup>8</sup>, and a plate F, pivoted to the  
65 latter, the pivots being arranged transversely of the said track, and thereby adapting the plate to swing vertically in line with it, having a lug to limit its swinging motion, of a finger-bar pivotally connected at one end to the  
70 said pivoted plate, gear-wheels held on the said plate and finger-bar and in mesh with each other at the pivotal line, a chain connected with the said finger-bar, a segmental pulley to which the said chain is fastened, a  
75 shaft carrying the said pulley, and a lever mounted on the track and secured on the said shaft for tilting and raising the said cutter-bar, substantially as shown and de-  
80 scribed.

9. In a mowing-machine, the combination, with the track B<sup>8</sup>, and a plate F, pivoted to the latter, the pivots being arranged transversely of the said track, and thereby adapting the  
85 plate to swing vertically in line with it, having a lug to limit its swinging motion, of a cutter-bar pivotally connected at one end to the said pivoted plate, gear-wheels held on the said plate and cutter and in mesh with each  
90 other at the pivotal line, a chain connected with the said cutter-bar, a segmental pulley to which the said chain is fastened, a shaft carrying the said pulley, a lever mounted on the track and secured on the said shaft for tilting and raising the said cutter-bar, and a  
95 notched bracket for locking the said lever in any desired position, substantially as shown and described.

LE ROY O. DREW.

Witnesses:

THEO. G. HOSTER,  
EDGAR TATE.